

An expedition to Christmas Island.

BY HENRY N. RIDLEY.

The expedition to Christmas Island undertaken by Dr. Hanitsch and myself accompanied by the two Assistant Taxidermists, De Fontaine and Ahwang, the plant collector Kassan and two boys, started for Christmas Island on September 20th, 1904, in the S.S. "Islander," and reached Anjer Point on the 23rd. The weather was bright and fine with a fairly strong breeze. Little of note occurred on the way except that I may record seeing no less than eleven *Attagen minor* together at one point in the Banka Straits, a moth, *Ophideres* sp. flew on board when we were nearing Anjer and well out of sight of land, and a snippet probably *Tringa* sp. flew round the ship.

The boat arriving at Anjer at night 7.30 remained till 11 but it was too late to go on shore. After passing Anjer Point the sea became very rough and we only reached Christmas Island on Sunday (25th) evening at five o'clock, too late to land baggage. That evening we remained on board till next day when all was safely landed and conveyed to a house kindly put at our disposal by Mr. Macpherson.

During the transit from Anjer the beautiful orange tropic bird *Phaethon fulvus* appeared first about midway between Java and Christmas Island. This bird was originally described from specimens of unknown locality. It appears to be almost confined to Christmas Island, but is said to fly as far as Southern Java. A large brown shark and a turtle were also seen on the way over.

After landing our baggage we made an excursion up towards the waterfall as far as the first Reservoir, collecting plants and insects, and on the following day I walked to the

waterfall, Dr. Hanitsch finding quantities of interesting specimens did not go as far. The walk about five miles is very picturesque. After passing through the Settlement one rises across two raised reefs, past the tram line which conveys the phosphate to the tip whence it travels by overhead wires to the wharf, and above the first reservoir arrives at the plateau. Here the flora is quite different from that of the reefs, or terraces as Andrews calls them. The seashore trees *Guettarda*, *Gyrocarpus*, *Berrya*, *Kleinhovia* disappear together with the *Abutilons*, *Croton caudatus*, *Acronychia* etc. The plateau forest chiefly consists of *Eugenia*, *Barringtonia*, *Pisonia*, *Cryptocarya*, *Sideroxylon*, while *Randia*, *Suprosma*, *Corymbis*, *Ardisia* and ferns form the undergrowth. The soil is dark brown and powdery, but here and there masses of coral reef protrude. The big crab, *Birgus Latro* and the smaller burrowing red crab, *Gecarcinus* are very abundant. Sea birds are absent though occasionally they may be seen crossing above the forest. The large pigeon *Carpophaga* is abundant and its cooings can be heard far and wide. The hawk, (*Astur*) is frequently seen, and the ground pigeon *Chalcophaps* and the thrush are abundant. Whiteeyes *Zosterops*, the swift *Collocalia* and in the evening the small bats only occur along the cleared tracks, and in more open places. The lizards too do not frequent the shadier parts of the forest.

After crossing the plateau one descends a steep slope to an open flat spot above the sea where are a few native houses for the men employed at the pumping station by which the water is pumped in iron tubes to the Settlement along the track. The water comes out abundantly flowing as it seems always to do from spots where the coral reef overlies the basalt. There are three more small streams along the coast to the north. Where the water comes out of the rock a small pool has been made in which are numerous small freshwater crabs and prawns, not previously recorded from the Island. The flora of this point includes numerous plants not met with on the other coast—*Calophyllum inophyllum* big trees with more straight and tall stems than one usually sees, *Ochrocarpus ovalifolius*, *Wedelia*, *Cyperus pennatus*, a shrub suspiciously

like *Clerodendron inerme* but of which I could never find a trace of flowers or fruit, *Crinum asiaticum* and *Ipomea pescapræ* were abundant there also.

Next day was devoted to the flora of the Cove and beyond Smith Point. Here just beyond the Magistrate's house there is a short track to the point, a mass of sharp-pointed coral with the regular seashore trees, *Pisonia grandis*, *Ochrosia*, *Ficus retusa*, *Pandanus nativitatis* forming dense thickets while on the barer rocks overhanging the sea are bushes of *Pemphis acidula* and *Scoevola* with much of the grass *Ischæmum*, and *Euphorbia hypericifolia*, and I added to the flora here *Cyperus Iria*, and a small *Selaginella* of which one or two bits were found growing in a hole in the rocks over the sea. Further search on several occasions was not rewarded by a single scrap more of this unexpected find. The great and continued hot and dry weather had dried up many of the smaller herbaceous plants, and this plant should be carefully sought again in damper weather. There is a fine view from Smith Point both into Flying Fish Cove and to North West Point and it is possible to push along the cliff edge by tracks used by fisherman for some way.

Dr. Hanitsch meanwhile had found a small puddle of water on the top of a rock containing Copepoda, which were carefully collected. A number of interesting plants were collected including fruiting specimens of *Acronychia Andrewsii*. The fruit, not previously described, is a small juicy flesh-coloured berry *Erythrina indica* was in flower and visited by numerous white-eyes which sought for insects among the scarlet blossoms. The tree appears not to be common now and I saw it nowhere else but here and round the Cove. I picked up flowers of it in the same district when I visited Christmas Island fourteen years previously. Among the rocky woods beyond Smith Point I found a large puffball about 4 inches tall with a broad stalk and a rounded top, $3\frac{1}{2}$ inches through. It was of a pale fawn colour outside, but when the outer coat was rubbed off bright yellow beneath, the flesh was white. There were a good many of the soft fungi to be found in the earlier part of our visit, in shady places, but as the country got dryer

they were more scanty. Among them I several times found two species of *Coprinus* both resembling species I have met with in Singapore, but these are so delicate and fugacious that before we could get them home they had utterly perished. *Polypori*, *Polysticti* and other woody fungi were very abundant on decayed wood and a large number were collected. I noticed in them a great scarcity of beetles. Usually these woody fungi are the prey of innumerable beetles of several different groups, but here I could find few or no traces of these insects even in old specimens. Two of the fungi here are eaten by natives. One is *Hirneola Anriculæ-Judæ*, the well-known Jew's ear fungus, known to Malays as chendawan Telinga.

The other is a white agaricus which is very common on dead wood, a very poor kind of food.

In the evening I walked along the cemetery road collecting.

On the next day, 29th, I walked with Mr. Macpherson to Phosphate Hill, and examined the quarries. Many of the introduced weeds from Flying Fish Cove have found their way up here already, the seeds carried up doubtless on the clothes of the coolies, but besides these I found the common grass *Setaria glauca* and the little yellow *Convolvulus Ipomea chryseides* there which I found nowhere else, both new records for the Islands. Pigeons were very abundant here, as the trees on the fruit of which they particularly feed were bearing heavily. These trees are *Sideroxylon* and *Cryptocarya*. The coolies here were felling many trees to clear the ground for further excavations, and this gave me an opportunity of getting good specimens of the above; mentioned trees.—*Hernandia* and a common tree with bipinnate leaves and rather hard green drupes. Of this latter I was never able to procure flowers, and have not yet identified * but it was not obtained apparently by Andrews. Passing through the coolie lines, we went along a track which had been cut for drainage and abandoned, and came to the edge of a high cliff from which could be obtained a beautiful view of North East Point.

**Tristiriopsis nativitatis* Hemsley

Looking down on the two great terraces lying below and running parallel with the coast line it was difficult to believe that we were looking down on the tops of trees over 100 feet tall. So dense and equal were they, that one seemed to be looking on grass and bushes. The cliff is about 600 feet above sea level, and nearly vertical, but it might be possible to descend it. The three terraces are distinct to the North but one runs out a little beyond the point where we were to the South where apparently at some time a good deal of stream denudation has taken place. This track was said to have been first made by Mr. Andrews so that we named its terminus Andrew's Lookout. Here grow several plants of interest. Just above the Lookout, were a number of gigantic smooth barked trees bare at the time of my first visit but at the end of our stay revisiting the spot they bore pinnate leaves, red when young, and panicles of small white flowers, with blackish drupes $1\frac{1}{2}$ inch long with acid yellow flesh. They were a species of Hog plum *Spondias*. The trees were too big to climb but we managed to get fallen flowers and fruit and a bough of leaves. This was an interesting discovery as the Hog plums are rather characteristic of Polynesian Islands. None were seen on any other part of the Island, nor on the lower cliffs of the North East Point. The ground was strewn with fallen fruit which was apparently not touched by any birds, or the fruit bats. They were much too far from the sea for the seed to have been washed up into that position, in the present condition of the Island, and the circumscribed area which they occupied, and the piles of untouched fruit beneath the trees seemed to suggest that no bird at present on the Island could act as seed-disperser. On the rocks of the cliff edge, were *Colubrina pedunculata* Baker, a large straggling shrub, just coming into leaf and bearing only the dry capsules of last season, and *Premna lucidula* Miq., a shrub of which we got fruit and flowers later. The common *Croton caudatus* formed troublesome thickets along the edge. It apparently flowers but seldom here, but its brilliant red withering leaves brighten up the woods and make it very conspicuous. *Ficus saxophila* a truly rock or rather precipice loving tree about twenty feet tall, had bright yellow figs on it,

but the figs of a tree at Steep Point were bright red. *Crinum asiaticum* a quite typical form is abundant here and all along this coast, growing in holes in rocks in rows on the precipices, a most unusual locality for this plant which one is accustomed to see in the sea sand. I returned by the branch pipe line to the Irvine Hall Reservoir on the waterfall track. In the evening collected among other plants at the wharf, *Ipomea grandiflora* a convolvulus like a poor and small form of the moon flower, *I bona-nox* and found also the pretty moth *Deiopeia pulchella* an insect which contrives to get all over the world, even to England where however it is considered very rare. It is common on the open rocks above the sea, and one came into light on one occasion. The lizard *Lygosoma atrocistatum* is common here, I saw it also on the sea rocks at the waterfall and at the further end of Flying Fish Cove. It never seems to go far from the sea and seldom appears till the evening.

Next day (29th) was spent in collecting in Flying Fish Cove and its vicinity and the following day I started up Phosphate Hill to go to the North East Point by way of the new drainage track from the coolie lines. The descent from the top of the upper terrace is over a mass of talus of coral rock rather steep and slow going, then through sloping woods, chiefly of *Celtis* and *Randia* to the sea cliff edge through a band of *Pandanus*, a fisherman's track. The scrub is too dense to get far along the cliff edge so we had to go through the wood along the coast line in a northerly direction. Having been informed that it was possible to get round North East Point and return by the cemetery track except for a barrier, which might be and indeed had been successfully passed we went as far as time would permit towards the North East Point intending to return the way we came. Passing through these woods a white egret was seen (*Demigretta sacra*?) on a spot which appeared to have been a stream. Soon the base of the second terrace was reached, and a troublesome mass of tall sharp rocks covered with a dense grove of pandans was crossed. By no means impossible though rough and wearying; expecting to come to the "barrier" we pushed on to a thick but more open bit, whence we returned, and eventually discovered

that this mass of rocks and pandans was the terrible barrier, its difficulties having been greatly exaggerated. In fact it is, though a stiff walk, quite possible to walk round the coast from the Settlement round North East Point to the waterfall and so back in the day without much trouble.

On Monday the 3rd October I went with the plant-collector past Rocky Point along the cemetery road to North East Point till we came to the Pandan Scrub again. *Hibiscus vitifolius* a tall mallow with primrose coloured flowers with a pink eye occurs here scantily. It has not been found elsewhere in the Island. A large shrubby plant like a *Triumfetta*, 6 feet tall with very adhesive capsules covered with viscid hooks, grew in masses. No flowers were seen. I found a mass of its burs adhering to my sock when I got home so sticky were they. *Celtis* was coming into flower as were *Macaranga* and *Grewia*. At one point fishermen or runaway coolies had burnt the scrub towards the sea the result of which was a dense upgrowth of *Gyrocarpus* seedlings now about 8-10 feet tall to the exclusion of almost every thing else. While taking lunch a whiteeye flew and settled on my bag where it dropped an ornamental red black and white cricket, new to our collections.

October 4th. This morning Dr. Hanitsch and I with the Plant Collectors and Taxidermists, as well as a Chinese pigeon-catcher, Ah Soo, started to explore the plateau ascending by a somewhat difficult passage up the rocks at the Northwest corner of the Cove, known as Tom's Ladder. This rock cleft was formerly easier on account of a big fig root which served as a hand hold, but it was now dead and rotten and broke in two. However by taking off our shoes with the aid of Ah Soo we succeeded in climbing up. The ground above was a steep earthy slope, with large bushes of *Colubrina* and a short tufted grass. *Panicum* n. sp. new to the flora occurred here, above the plateau is level, and we went along a pigeon-catcher's track till it joined the Murray Hill Road and brought us out on the pipe-line at Irvine Hall. Ah Soo climbed one of the trees and caught three of the large pigeons with a noose on the end of a long stick, and could

have caught two more had we permitted it. The birds which sat together in the top of the tree did not seem the least alarmed at their companions being caught. We were informed that during high wind they never coo, and indeed they certainly were more quiet when the wind blew at all strongly. I may say that I never but twice saw any on the ground. One at the waterfall appeared to be sick or injured, the other was a strong healthy bird. Ferns are abundant on this part of the plateau the ground being covered in parts with a dense carpet of *Acrostichum*. I sought carefully for the *Trichomanes parvulum* but only found its prothalli, perhaps the adults had dried up owing to the heat. In the evening I succeeded in catching the humming bird hawkmoth *Macroglossa* which I had tried several times before to get. It frequented the flowers of *Morinda* at dusk. This far ranging insect had not previously been taken in the Island. The next two days were occupied in exploring Phosphate Hill, and the coast beyond Smith Point. The shore terrace here is very barren the flora being very monotonous, and the greater part of the way covered with pinnacles of coral rock very troublesome to cross.

On the 7th all started to the waterfall to camp there for a few days. We obtained through the kindness of Mr. Mcpherson a number of Chinese coolies and the use of a pack pony. For shelter we took two Government tents which were very fine affairs but utterly unsuited to the country, as it required 13 men to carry them which with the very limited number of coolies ever available, makes their use almost impossible. The first plant of note obtained was a grass which made a close soft turf often 6 inches or more deep, on the cliff tops above the sea. It proved to be *Lepturus filiformis* and I was told that it was a good fodder grass for horses, who would not however eat it until it had been well washed to get rid of its salinity. A number of small brown and green grasshoppers frequented it and were seen nowhere else. They were coloured so like the leaves and stalks of the grass that they were not easy to see and often when pursued dived down among the stems where they could not be caught.

In the afternoon I went with Kassan through the woods along the shore to the south towards Steep Point, and after passing through a mass of lofty and picturesque rocks, found a fisherman's track which ran along a projecting point of rocks and ended in a very pretty little bay, with a white coral beach beyond which the big rollers broke over great masses of coral reef, where were many of the splendid large blue fishes which seem constantly to haunt the broken water on the reefs. On the right of the bay facing the sea the rocks were low and broken up into sharp pinnacles, troublesome to walk over. *Tournefortia*, *Scoevola* and a curious form of *Pemphis acidula* were the characteristic plants. The *Pemphis* formed large shrubs more or less erect except where exposed to heavy winds, where they were quite prostrate covering the rocks with a close mat of twigs and foliage, but the most remarkable point about this form was the very thick fleshy leaves, quite unlike those of the common form round Flying Fish Cove, which had the usual rather hard and dry leaves. Its appearance, especially that of the prostrate form, was so different that I took it at first for a distinct species, but the flowers and fruit are identical with those of the ordinary form. A few seaweeds and some fine cowries were obtained on the reef, and then we ascended the higher promontory on the North side of the bay by a fisherman's track. It was covered in part with a mass of the yellow flowered composite *Wedelia*, with bushes of *Tournefortia*, *Pandanus*, etc., but the terminal portion of this promontory consisting of the same brown pinnacles of rock as on the other side produced only the pink-flowered fleshy plant *Sesuvium portulacastrum* not previously recorded from Christmas Island. An old Javanese woman at the Waterfall told us that the *Sepit* as she called it was delicious when cooked and that she was a great hand at cooking it. Though abundant so close to the Waterfall she had no idea that there was any to be got. A day or two later we collected a quantity and had it boiled. It was indeed excellent, tasting like something between French beans and spinach. It requires however a good deal of washing previously as otherwise it is very saline. The plant is one of very wide distribution and occurs on most

tropical sea coasts in the Old and New Worlds, growing on rocks or mud always close to the sea. From this headland a good view of Steep Rock and South Point can be got. Sea birds were abundant here, and the common boobies were nesting among the pinnacles of projecting rock. The nests were placed on the ground and consisted of bits of stick, birds bones, scraps of *Sesuvium*, etc. The eggs were two, chalky white and usually dirty. One nest contained two unfledged birds, one of which was dead, Revisiting the spot later I found the dead bird gone and the other apparently dying. Though there were generally two eggs in the nest I never except on this occasion saw more than one young bird in a nest, whether the female bird is unable to bring up more than one at a time I do not know. In or close to the nest was usually a fish to be seen, brought by the parents. The hen bird usually sat alone on the nest, feebly pecking from side to side at nothing when a stranger approached. Occasionally the male sat by her also, but except for the feeble demonstration of anger described they made no attempt to defend the nest. The female when approached too near tumbled and flapped along the ground as if either too stiff with sitting or feebly pretending to be injured. In the trees in the bay a number of young boobies in white plumage sat so tame that they could easily be touched by hand, although they could readily fly. Dr. Hanitsch photographed a group. The small black heron and white egret were also seen in this bay. On our way back to camp Kassan discovered a plant of a species of *Balanophora* entirely pale yellow. This was a most unexpected find, as these parasitic plants were not recorded from any oceanic Island previously. Careful search for more produced no result here but I later found another above Steep Rock, and one in the centre of the Island. The plant was growing in loose soil on the shore terrace which was wooded with the ordinary shore terrace trees and covered with an undergrowth of *Dicliptera* and *Asystasia*.

The next day (8th) I started northwards to the first freshwater stream, a thin flow of water over rounded muddy rocks covered thinly with moss. Here grew the fern

Nephrodium truncatum and there were abundance of the blue crab with white claws *Cardisoma carnifex*. This crab is only to be met with round these freshwater streams, and their presence shows the proximity of water. I found some however in the forest about a quarter of a mile from the Waterfall, where no water was visible above ground but there was said to have been a stream there at one time. This is the only crab eaten by the natives, who often bring baskets of them into the Settlement and even take them as far as Singapore. Leaving the wood I went along the coast for a considerable distance and found two more streams similar to the first. In many places the pandans which fringed the coast had been burnt evidently by fishermen to get at the sea cliffs for fishing, and they were often replaced by patches of the saltgrass. At one spot was quite a grove of fine Arengas, the ground beneath being almost bare of vegetation. Epiphytic plants are much scarcer in these shore woods than further inland. A few *Saccolabiums* only were seen. The grass *Ischaemum foliosum* so abundant on the cliffs of the North part of the Island, is very scarce on the East and South Coast.

On the following day I started with the Plant Collector for Steep Point, a great vertical cliff to the south, being especially desirous of finding "*Asystasia coromandeliana*" said to have been collected by Andrews there. As this plant commonly cultivated in Singapore occurs wild only in Africa and India it seemed highly probable that there was a mistake in the identification of Andrews' plant. I was quite unable to find a scrap of it wild or cultivated anywhere in the Island, but a very distinct species of the genus is abundant on the shore terraces near Waterfall and elsewhere. Having walked to the Whitebeach we made our way along the coast over the sharp pinnacles of coral reef to a stream bed coming down over basalt rocks but quite dry at that time. The rocks were covered with the prostrate fleshy-leaved *Pemphis* with tussocks of *Fimbristylis cymosa* in the hollows. Then we pushed through a very bad bit of thick scrub which had grown up since the whole of this place had been burnt about a year and a half previously. After climbing up a steep rock face on to a spur

parallel to Steep Point, we found it was necessary to cross to the main hill through a dense mass of scrub composed chiefly of interlaced *Wedelia* over blocks and pinnacles of coral reef. It was intensely hot, and there was no shade, and the work was extremely arduous and exhausting. Then we had to force our way up the great masses of coral rock covered densely with pandans with cudrania and other climbing plants. The whole of this part of Steep Rock to the edge of the cliff is covered with great masses of rock with deep hollows between and covered with thick growth of climbers, Pandans and Ficus and other trees. After a short rest and a drink of cold tea quite inadequate to allay my excessive thirst we felled an Arenga Palm for the sake of the refreshing cabbage of the bud and sought in vain for the *Asystasia*. Another plant of the *Balanophora* was found, fruit of the big tree *Ochrocarpus*, and some other botanical desiderata. Then crossing the ridge northwards and descending a steep slope of loose blocks of coral reef we made our way across the upper part of the dried up stream, hoping to find water as the streams usually break out at the junction of the coral reef and basalt and then after a short distance go underground again. No trace of water was seen, but pushing on through the forest we met with the fisherman's track and in an hour or so got to the Waterfall and lost no time in slaking our thirst at the stream. There is doubtless an easier way of getting to Steep Point than either the way we went or returned, but it would be necessary to go a good deal further inland well above the source of the stream, and in any case it would be a stiff walk.

10th—Next day, we went along the coast to the South East, descending to the shore where it was possible, which it is at several spots, not far from the promontory which bounds Waterfall Bay on this side. The first descent was made over the basalt outcrop. The basalt here is somewhat columnar and in parts in balls or nodules surrounded and aggregated by crystalline carbonate of lime. A number of seaweeds, *Sargassum*, *Turbinaria*, etc., were collected in the rock pools and *Mariscus albescens* almost out of flower and burnt up by the drought was found, a new record for Christmas Island though

it is one of the most widely distributed of sea-shore sedges. In another small bay were found three shells of nautilus, and a rhizome and several cut bamboos, which must have been drifted for a long distance there being no bamboo on the Island. The pieces of bamboo were all dry and the rhizome was probably dead when it reached the Island. Although I sought constantly for washed up seeds, etc., on the shores of the Island I could find very little. Seeds, dead, of *Terminalia Catappa* and *Guettarda speciosa*, both common plants on the sea coast and one broken shell of a seed of *Pongium edule* a native of Java were all I could see. Drift wood was also not common. Perhaps when storms occur more seeds and wood are drifted across from Java and elsewhere. Many years ago I received from Mr. Ross an extensive series of seeds drifted up on Cocos Island and one can hardly doubt that many of the trees and shrubs inhabiting Christmas Island are descended from seed drifted there from more distant localities. I was, however, surprised to find so few drift seeds on the beaches. After dark a Malay man captured a large yellow tabby male cat, which said to have escaped a few years ago from an European had become feral. It was extremely savage and bit and scratched the Malay severely, having grown very large and powerful. Although it had been for some time in the forest it had not wandered far from the Waterfall Settlement, and though there was plenty of food in the way of rats and birds in the forest, it had become a nuisance by killing the chickens belonging to the coolies. After it had been confined in a box for a short time it became quite tame again and before we left was quite quiet and merely kept on a string to prevent its taking again to the woods. When Andrew's book on Christmas Island was published there were no cats on the Island and he deprecates their introduction on the grounds that if it were to increase to any extent the sea-birds would probably be destroyed or diminished in numbers. There are plenty of cats on the Island now but except this one it does not appear that any have taken to the forest, and should they do so they are more likely to destroy the ground pigeon, thrush and white-eye which are more terrestrial birds

than the seabirds which only roost in the higher branches of the big trees and never come low enough for a cat to catch them. Far more dangerous would be the introduction of the civet cats (*Paradoxurus*, etc.,) as these animals are arboreal and would cause great havoc with the pigeons which they could easily catch. Malays often carry these animals about as pets and some one might perhaps introduce a pair, which would be very regrettable.

On October 11th we all returned to the Settlement, On the way I found *Pittosporum nativitatis* in flower for the first time. It is a common little tree on Phosphate Hill and parts of the plateau. The fully developed inflorescence is not as compact as it is figured and described in Andrews' book. It is a short but well branched panicle. The butterfly *Junonia villida* was first seen this day, and thence till we left was common though very active and difficult to catch.

Next day was occupied in collecting along the Cemetery Road, and at low tide in the afternoon in collecting seaweeds, shells, etc., on the reef in the Cove. The first *Hypolimnas misippus* was seen this day after which it became very abundant, evidently bred in the Island as the specimens were in excellent condition. Two days later a white butterfly *Pieris* sp. appeared. Specimens were caught later. It was not previously recorded from the Island. The next two days were spent in collecting round Rocky Point, Phosphate Hill and the Cove, and packing live plants to transit to Singapore by the "Islander" which had arrived. The whole of the neighbourhood was so dry that not only orchids but palms and ferns were sent dry in wooden boxes and arrived safely and in good condition.

On the next two days arrangements were made for an expedition to cross the Island over Murray Hill to the West Coast where at Hugh's Dale it was expected to find water. No one on the Island apparently had ever been to Murray Hill by that route, but there was a track for some way known as the Murray Hill Track, starting from a little beyond Irvine Hall. Accordingly tents and provisions were brought to Irvine Hall, and with a number of Chinese coolies the expedition started

on Monday morning 17th at 8 o'clock, Mr. Macpherson and Messrs. Jones and Jackson of the Phosphate Company accompanied the expedition and they with myself preceded the coolies to cut the track and blaze the trees. The track is quite level and goes due west at first and except for a few big fallen trees could be used by ponies, but it was more overgrown further on. At 3 o'clock we cleared a piece of forest and pitched camp, the coolies and Messrs. Macpherson, Jones and Jackson returning to the Settlement.

18th—Messrs. Jones and Jackson came up about 9 o'clock, but the coolies delayed so long that they did not arrive till 1 p.m. We then went on for about 1½ hour and pitched camp again. Messrs. Jones, Jackson and I went a long way on what was supposed to be the right track starting from a spot where encampments had previously been made and where there were traces of four tracks going respectively south, south west, north west and north. The Southwest Track well marked, was the one taken. The yellow *Ipomea* was very abundant here, and very showy. From the old encampment, supposed to have been used by Ross, one of the party affirmed he saw the sea to the south. The track went south-west chiefly and descended to about 700 feet. The coolies were sent back to the previous camp for the night to come on in the morning. *Birgus* was more troublesome this night, coming into the tents several times. One stole a saucepan, others took away old tins. Pigeons were abundant here, and the hawk is not uncommon. Our water supply was rather short and had to be used with care, and only for drinking and cooking. Close to where the camp was pitched we came upon the very fine *Hibiscus (abelmoschus) Vrieseanus* a tall herb about 12 feet tall densely covered with pungent bristles and with large yellow flowers with a deep claret coloured eye. Also a number of plants of a small ground orchid *Zeuxine* and a single plant of a saprophytic orchid *Didymoplexis*; *Dendrobium* was common here and a *Thelasis* apparently identical with a Javanese species was found on fallen boughs of trees. *Ipomea peltata* with its large yellow flowers was climbing up the smaller trees. The common plateau trees,

Eugenia, *Sideroxylon*, *Barringtonia*, *Laportea* with *Randia* formed most of the forest, and *Guettarida* and *Ochrosia* which do not generally occur on the plateau were both here. A little rain fell during the night. The robber-crabs, *Birgus latro*, invaded the tents and stole a boot, and a killing bottle, which was found next day broken under a pile of cut bushes.

19th—Messrs. Jones, Jackson and I with Kassan started early, leaving the coolies to follow along the track we had marked yesterday. After a short way we noticed we were descending, and eventually the track disappeared, pushing on we came to a ridge of phosphate of alumina and iron, a curious rock resembling sandstone at first glance. This is the rock abundant at Murray Hill. We then came to an old encampment with a bucket, a tin, a grindstone and a pair of shoes, evidently a very old encampment. The ground descended very abruptly to an old stream bed. We appeared to be near the sea but there were no tracks or blaze marks. As it was obvious we were not near Hugh's dale, we pushed on to find out where we were, and at last got to a cliff edge from which the sea could be seen at our feet. We were on the top of the upper terrace of the south coast about two miles from Egeria Point. The view of this point never yet reached by anyone as far as is known was very fine. The immense vertical cliffs densely covered with trees ran in a curve to the point where we were, Below them was the shore terrace, with at one point as far as could be judged an outcrop of basaltic rocks. Immediately below us was a great densely wooded gorge. It was obvious that no water was to be found here, and it seemed impossible to descend these precipitous rocks. A message was sent back to the Settlement for more water as very little remained. The coolies were sent back and we camped for the night. The forest here was botanically poor, the only plant of interest being *Melochia arborea* of which a large tree was seen over the precipice. Pigeons were abundant. Dr. Hanitsch took photographs of Egeria Point and of a booby on its nest among the rocks. The *Birgus* was abundant here, and constantly entered the tents at night. One seized a towel while dinner was being cooked and during

the night one conveyed outside the tent a bottle of quinine lying near my head. It was found open but unbroken a short way off.

20th—We decided to retreat to the Settlement without delay leaving the baggage to be fetched by the coolies who would be sent, as there was hardly any water left, and none to be got nearer than Irvine Hall, and all but Dr. Hanitsch who wished to remain till the arrival of the coolies, and his boy, started at daybreak. Messrs. Jones and Jackson went ahead and met the coolies near the first camp and came back with them. I went to the first camp and remained there till the coolies returned, collecting plants in this district. More *Diodymoplexis* and *Balanophora* were found. The whole party having reached the first camp about 2 a quick march brought us clear of the forest and into the settlement before dark. The whole distance appeared to be about 15 miles. As ships were now expected in every day, it was impossible to procure the service of any more coolies till the end of our visit as all were wanted for loading the vessels.

21st—The morning was occupied in changing the herbarium papers and a short walk to Smith Point to try and get more of the *Selaginella*, but I was not successful. *Heptapleurum* was just coming into flower, though it had shewn no signs of buds before we left the Settlement. Another *Laportea* was also flowering, and a large tree with panicles of yellowish berries and very dark green leaves was met with and eventually with some difficulty as the tree was too thick to climb Kassan got specimens of it. In the afternoon I went to Irvine Hall to bring down some large fruits of the big *Pandanus*, I had left there, and Dr. Hanitsch to Phosphate Hill to fetch away some fossils, etc.

22nd—I went along the rocks beyond Smith Point as far as was possible. It was extremely hot and the vegetation somewhat dried up, so much so that the younger trees of *Ochrosia* were often quite withered the whole day not recovering even after the nocturnal dews. Many of the smaller plants such as *Capsicums* were also drooping even in the woods. On the rocks beyond Smith Point was a pubescent stunted

form of *Physalis minima* looking very different from the tall glabrous plant common in cooler and less rocky spots. In the afternoon among other things the climber *Limacia* n. sp. was found in flower for the first time.

24th—Went up to Irvine Hall with my boy, Kassan, and two boatmen and a gardener to stop there the night and start early for the Murray Hill Track next morning. Accordingly started at 6.15 and walked fast to Ross' camp and started from there along a track to the Northwest, at the commencement of which was an inscription in Chinese stating that it was the road to the big hill and place for water. The track immediately disappeared and the woods proved very dense. Here I noticed upwards of a hundred *Birgus* beneath an *Arenga* devouring the fruit. They had eaten almost every seed rejecting the pulpy outside cracking and eating all the seeds with their powerful jaws. After pushing a long way and finding no track or rise, I thought it advisable to return and found the men behind had neglected to mark the track properly, so that we had some difficulty in finding the way back. After a short rest returned to Irvine Hall and after a cup of tea back to the Settlement. The whole time occupied in walking was ten hours and a half. It is clear that it is practically impossible to get to Murray Hill and back in the day, unless the track was specially opened beforehand. A few specimens of various plants were obtained and the phosphate rock again met with. *Dentrobium* sp. was in flower.

Next day I went to North East Point collecting flowers of *Pisonia excelsa* which are white and scented like almonds, and *Croton caudatus*, just coming into flower.

26th—To Andrews Lookout, crossing Phosphate Hill. Here I found large trees of *Spondias* in flower with fruits also. The trees were too big to climb but we were able to find fallen sprays of flowers and plenty of fruit and to get leaves. *Premna lucidula* a small straggling tree was in flower as was *Crinum asiaticum* but this latter on the face of the precipice was inaccessible. A fine cycad was seen in the wood growing on a rock.

27th—To the foot of Tom's Ladder in Flying Fish Cove, where *Polypodium Phymatodes* new to the flora was found growing on the cliffs of coral reef, but only a few plants. The way along the foot of these cliffs is troublesome being a steep mass of coral reef talus, after passing which one comes to the outcrop of basalt and ash, with a talus of fine dust often difficult to cross. It was extremely dry here and many of the plants were quite dried up. This is the only place at which I found the peculiar grass *Panicum Andrewsii* which was almost quite withered up. The pink flowered *Boerhaavia* grew upon the rock faces. To add to our difficulties at one place stones were falling from the top of the high cliff. Finally coming to in impassible precipice I descended by a long slope to the Cove.

The next day the "Islander" arrived. I walked over to the Waterfall and got *Ipomea biloba* in flower and *Nelochia* also. The 29th was spent chiefly in collecting plants for cultivation near Tom's Ladder and while so doing I found a single plant of the rare *Asplenium* on the cliff there. Next day explored the cliffs behind the Cove further towards the East, but got but little of interest. Part of this route requires careful climbing as the rocks are often loose and dangerous. A very large rock shifted its position while I was passing it and fell on my leg, but I fortunately managed to get from under it as it fell and escaped with a deep bruise, otherwise it would certainly have broken my leg. Further on we came to a spot where by the aid of fig-roots it is possible to climb up to the plateau where there is a track leading to the pipe-line and so to the Settlement.

28th—The first rainy day since our arrival, raining almost all day. The "Islander" left the next day for Singapore. There were heavy rollers for the first part of the day and steady rain for most of the voyage which ended at about 7 p. m. on November 2nd.